

Modeling the Impacts of Terrorist Events on Confidence and the Economy

The attacks of September 11 highlighted the fact that terrorists are capable of causing long-term debilitating economic impacts to our nation, stemming from the direct effects of the event and from a longer-term lack of confidence at many levels.



Utilizing massively parallel computing and a technique known as agent-based modeling, the Department of Homeland Security Advanced Scientific Computing Program is developing a simulation capability that will allow the Department of Homeland Security to analyze how terrorism affects our economy to help understand what mitigation strategies could be the most effective.



Outline

- **Objectives**
- **The Model**
- **Current Status**
- **Prototype model is up and running**
- **Possible Applications**
- **Next Steps**



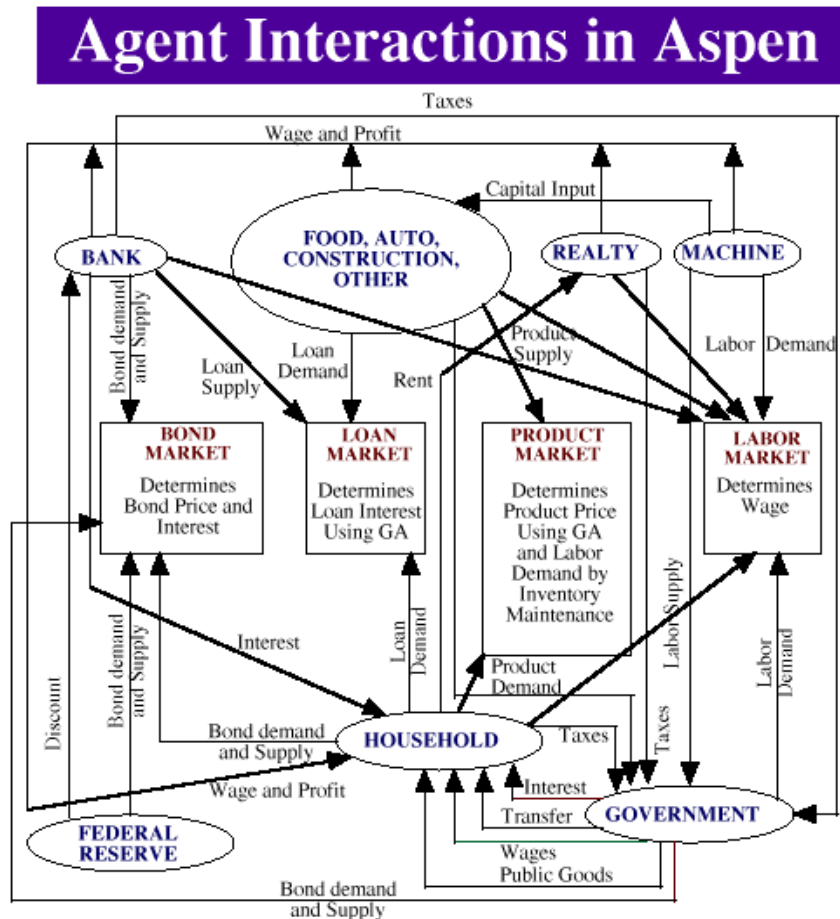
Objectives

- **The model will:**
 - Reveal how terrorist events will degrade consumer, investor, and business confidence, and cascade into broader lingering economic consequences
- **Analysts will:**
 - Examine threats resulting in disruption to...
 - transportation & distribution
 - commerce & financial markets
 - Estimate economic repercussions in measurable terms...
 - consumption & wealth
 - employment & capital expenditure
 - jobs & dollars
 - Compare the relative economic severity of attacks on different targets
 - Compare mitigation strategies to minimize economic impacts

The Model

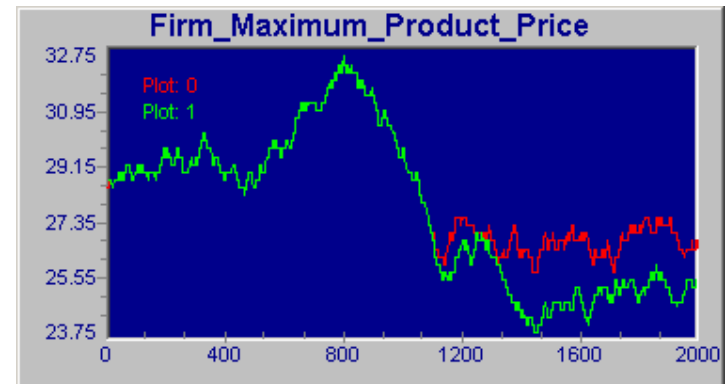
- **Model elements**

- Agents
 - Durables
 - Non-durables
- Product Markets
 - Bonds
 - Stocks
- Financial markets
 - Spending & savings
 - Employment & capital
 - Expectations & forecasts
 - Confidence



The Model

- **Economic disruptions & impacts**
 - Transportation & distribution
 - Imports
 - Confidence
- **Simulation results (example)**
 - Baseline (red)
 - Post event (green)
- **Applications**
 - Analyze consequences
 - Compare mitigation strategies
 - Compare response strategies



The Model

- **Calibration & validation**
 - Market & economic data
 - Confidence data



Consumer Confidence Report

The Conference Board's Consumer Confidence Index, which had improved last month, weakened significantly in February. The Index now stands at 87.3 (1985=100), down from 96.4 in January. The Expectations Index fell to 96.8 from 107.8. The Present Situation Index declined to 73.1 from 79.4.

Source: www.consumerresearchcenter.org/consumer_confidence/

Business Confidence Index Series

1999 03	9.00	2001 04	6.27
1999 04	7.00	2002 01	15.95
2000 01	0.60	2002 02	14.78
2000 02	-5.30	2002 03	13.70
2000 03	0.60	2002 04	6.60
2000 04	-4.22	2003 01	1.81
2001 01	-4.21	2003 02	6.13
2001 02	10.50	2003 03	16.97
2001 03	16.70	2003 04	9.36

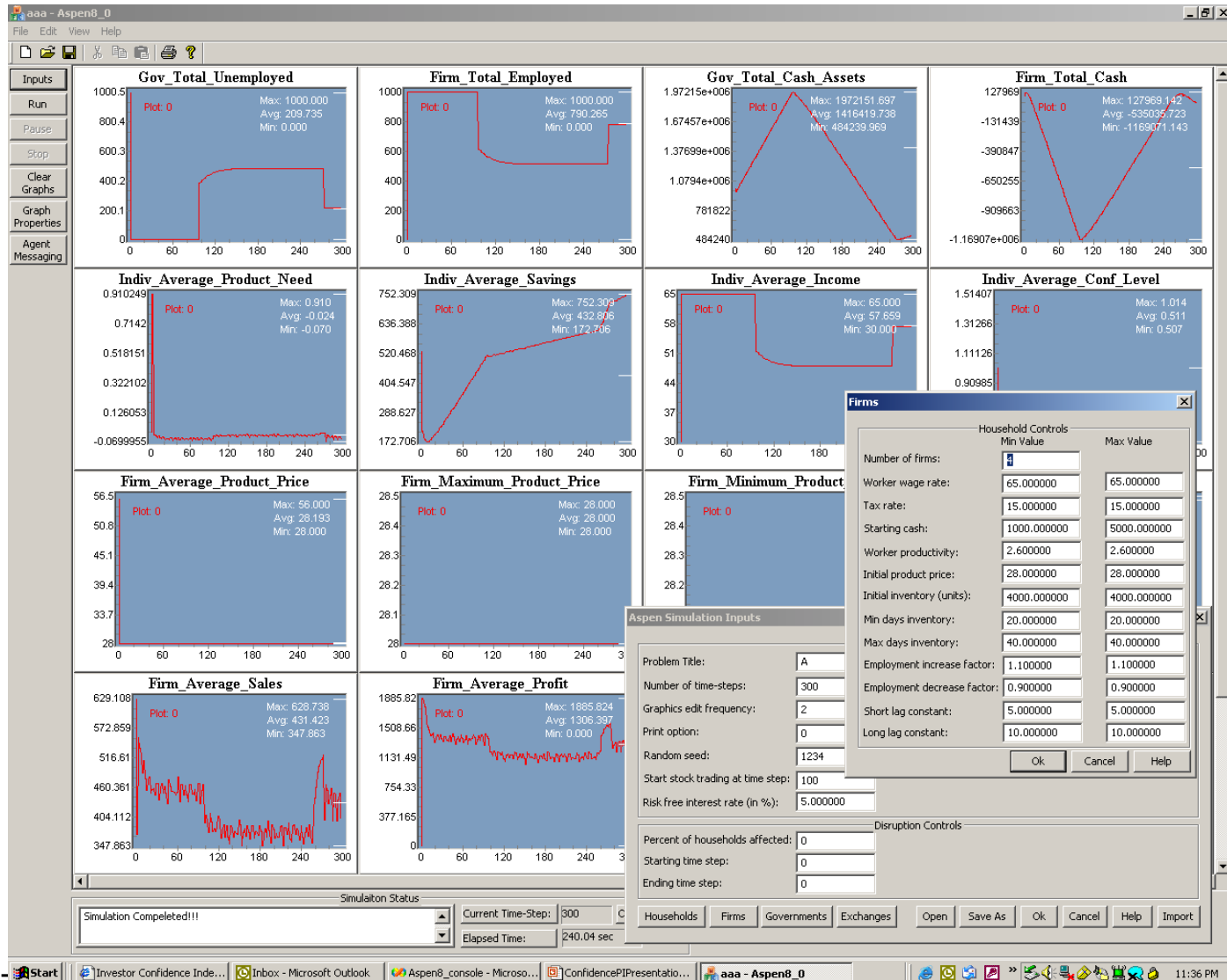
Source: www.economagic.com/em-cgi/data.exe/rba/gicnbc



Current Status

- **Prototype model**
 - Households & Firms
 - Stock market
 - Government
- **User interface**
 - Specify population of agents
 - Specify initial conditions
 - Specify disruption
 - Watch macro-variables converge & respond
- **Analysis**
 - Input/output data files

Prototype model is up and running



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Possible Applications

- **Events & scenarios**
 - Acts of terrorism
 - Contamination events
 - Disruption of trade ports
 - Natural disasters
 - Responses to biological threats
 - Trade developments & global oil market
- **Model applications**
 - Analyze consequences
 - Compare mitigation strategies
 - Compare response strategies

Venezuela threatens to withdraw US oil supplies

The Americans already have their hands full in the Caribbean in dealing with political problems in Haiti. But now Venezuela is cranking up the rhetoric, threatening to withdraw oil supplies if Washington intervenes in its internal political problems.

Source: www.abc.net.au/worldtoday/content/2004/s1062199.htm

Saudi Arabia:

Caught between reform and regime change

Anticipating further domestic turbulence, Saudi rulers are holding a “Convention of National Dialogue” to develop programs for radical change from within. But already the “question of the year” is whether even those measures are too little too late to forestall political instability.

Source: www.nyu.edu/globalbeat/syndicate/ahrari012604.html

USDA plans to triple testing for mad cow

The U.S. Department of Agriculture is expected to announce as early as this week that it probably will triple the number of cattle it plans to test this year for mad cow disease.

Source: www.indystar.com/articles/3/127831-2333-010.html

US chicken imports suspended

Several Asian countries have suspended imports of US chicken as details of an outbreak of bird flu in the state of Delaware are investigated.

Source: news.bbc.co.uk/1/hi/world/americas/3469795.stm



Next Steps

	<u>03</u>	<u>04</u>	<u>05</u>	<u>06</u>
• White Paper	✓			
– strategy and approach				
• Explicit banking model		✓		
– confidence, credit markets & interest rates				
• Capital expenditures and employment		✓	✓	
– business confidence, labor and capital markets				
• Translate terrorist threats into shocks		✓	✓	
– compare baseline to shocked economy				
• Household financial models		✓	✓	
– spending, saving & investment				
• Demonstration of test case			✓	✓
• Disaggregate industry classes			✓	✓
• Incorporate oil industry				✓
– global market				
• Scripting & optimization				✓